

Research of Histogram

DingHao

January 6, 2017

Contents

Histogram Equalization

- Task

- Introduction

- Method

- Result

Histogram Equalization

Task

Choose a grayscale image

1)

applying global histogram equalization(HE) to it

2)

applying adaptive histogram equalization(AHE) to the image and try to exchange the size of topical blocks

3)

discuss the results

Histogram Equalization

Introduction

- Histogram: straggling probability density distribution
- Histogram equalization: using justify space between grayscales
 - dynamic histogram equalization
 - global histogram equalization(HE)
 - adaptive histogram equalization(AHE)
 - contrast-limited adaptive histogram equalization(CLAHE)
 - bilinear interpolation
 - histogram normalization

Method

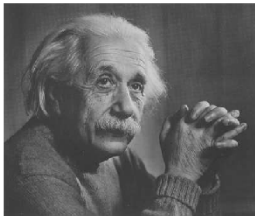
HE

1. draw the histogram $p_r(r_k) = \frac{n_k}{N}$
2. calculate the integral histogram $s'_k = T(r_k) = \sum_{j=0}^k p_r(r_j)$
3. multiply the integral histogram by 255 $s_k = (L - 1) s'_k$
4. the result is the output

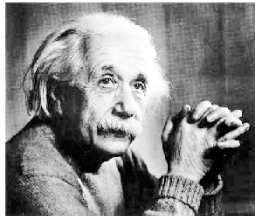
Method

HE

origin



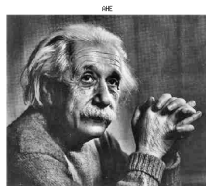
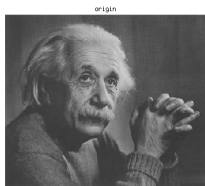
HE



AHE is the regional HE

Method

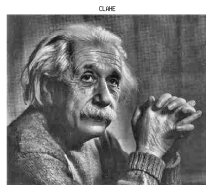
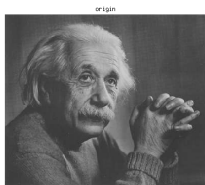
AHE



limit noise amplification

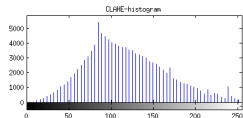
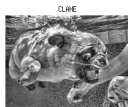
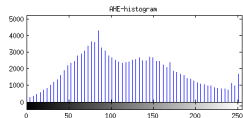
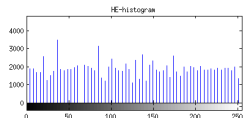
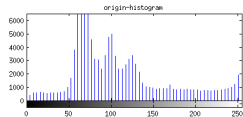
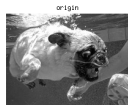
Method

CLAHE



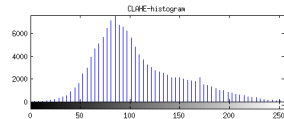
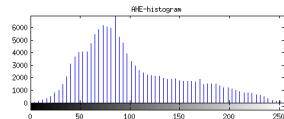
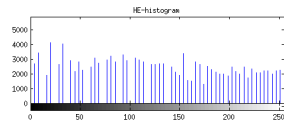
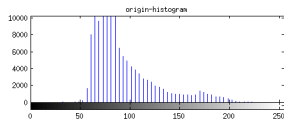
Result

Different images



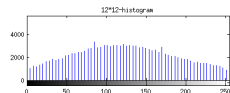
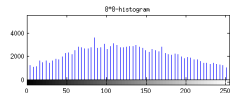
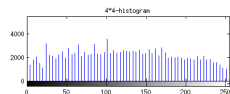
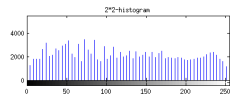
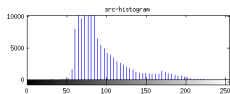
Result

Different images



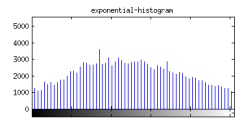
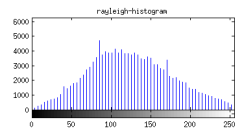
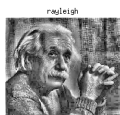
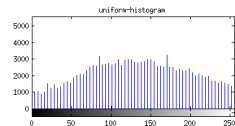
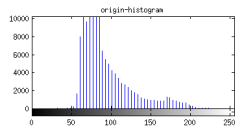
Result

Size of blocks



Result

Histogram normalization





Q&A